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Air Vehicles Directorate tests Joined Wing Demonstrator

by Sue Baker, AFRL Public Affairs

WRIGHT-PATTERSON AFB, Ohio --- Researchers at the Air Force Research Laboratory flew a seven percent scaled Joined-Wing Technology Demonstrator for the first time Sept. 22. The light was in support of a future Intelligence, Surveillance and Reconnaissance (ISR) aircraft design, the SensorCraft, which is under development by the lab's Air Vehicles Directorate, Sensors Directorate, and Propulsion Directorate.

The SensorCraft will use sophisticated, emerging technologies to merge space, air and ground-based sensors into a "God's-eye" view of the joint battlespace.

"The Joined-Wing design option supports the SensorCraft project because of its natural compatibility with 360-degree ISR coverage," said Max Blair, flight director.

"The Joined-Wing also has unusual flight characteristics that must be taken into consideration from design and operational perspectives, including redundant control surface effectors, landing gear configuration, pusher prop and all-electric propulsion."

The Joined-Wing flew between 7 and 11 a.m. in virtually perfect weather conditions, Blair said. "The vehicle is stable and clearly controllable on all three axes, though its pitch response is a bit sluggish due to conservatively-placed (forward) center of mass. But we are fairly confident that the aerodynamic analysis adequately identified the aerodynamic center, and the response in roll is better than expected -- thus helping us to calibrate the vehicle dynamics model. The front nose strut is not durable, but



First flight of the Joined-Wing Technology Demonstrator took place Sept. 22 at Wright-Patterson AFB, Ohio.

it is fail-safe."

"The 25-person flight test team has proven itself worthy by the first flight of this unusual configuration," Blair said. "Future work on this vehicle will include reconfiguring the redundant control system, the wing's landing gear and removing its additional vertical tail fin. This is a first step toward scaled flight research in order to validate non-linear aeroelastic flight characteristics of High-Altitude Long-Endurance concepts."
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